Gale F. Parker San

County Surveyor
Astoria

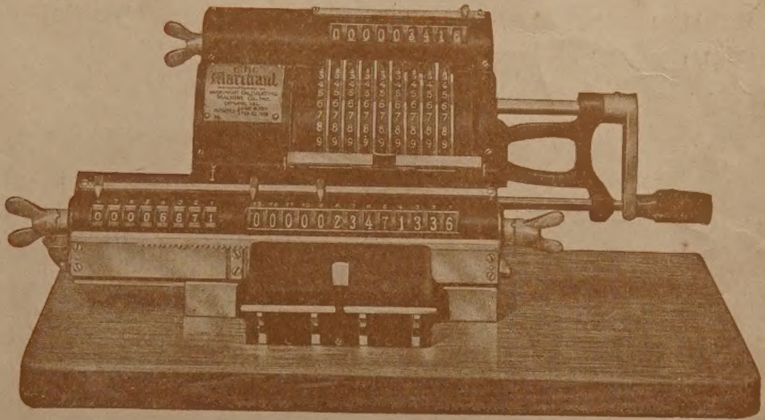
the
Marchant
Calculator

book of instructions

INSTRUCTIONS FOR OPERATING

THE

Marchant



CALCULATOR

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MARCHANT CALCULATING MACHINE CO.
EXECUTIVE OFFICES AND FACTORY, EMERYVILLE, OAKLAND, CALIF.

The MARCHANT Calculator is especially designed for work involving multiplication, division, subtraction, and their combinations. The automatic shift and easy, direct action of the handle make it the fastest multiplying and dividing machine on the market. In the new PONY model, a combination of light weight, small dimensions and smoothness of operation is obtained—noise being practically eliminated.

With average use and good care a MARCHANT should last for ten years. The wearing parts alone are guaranteed against defect for five years and free adjustment and repairs for one year.

GUARANTEE

Emeryville, Calif.

Date ....

The MARCHANT CALCULATING MACHINE CO. hereby guarantee MARCHANT CALCULATING MACHINE No............., Type............, sold this day by them to..to be of the best material and in perfect condition.

Machine guaranteed for a period of five years from date of purchase against defective material, such defective material to be furnished free of charge by the Marchant Calculating Machine Co., and further agree to keep said machine in good running order free of all charge for a period of one year from date of sale.

IMPORTANT

Here are a few simple rules to remember in caring for your MARCHANT:

Always see that clearing wing nuts (see Fig. 1-6) are in position before operating. Same **must not** be left out of place.

Don't put oil in machine. Oil handle and carriage slide only.

To remove carriage, unscrew end stop on left end of carriage and pull to right as far as possible; use carriage release in center of shifting mechanism.
Operate with an even swing of handle.

Remember this is a valuable instrument and is worthy of the best of care.

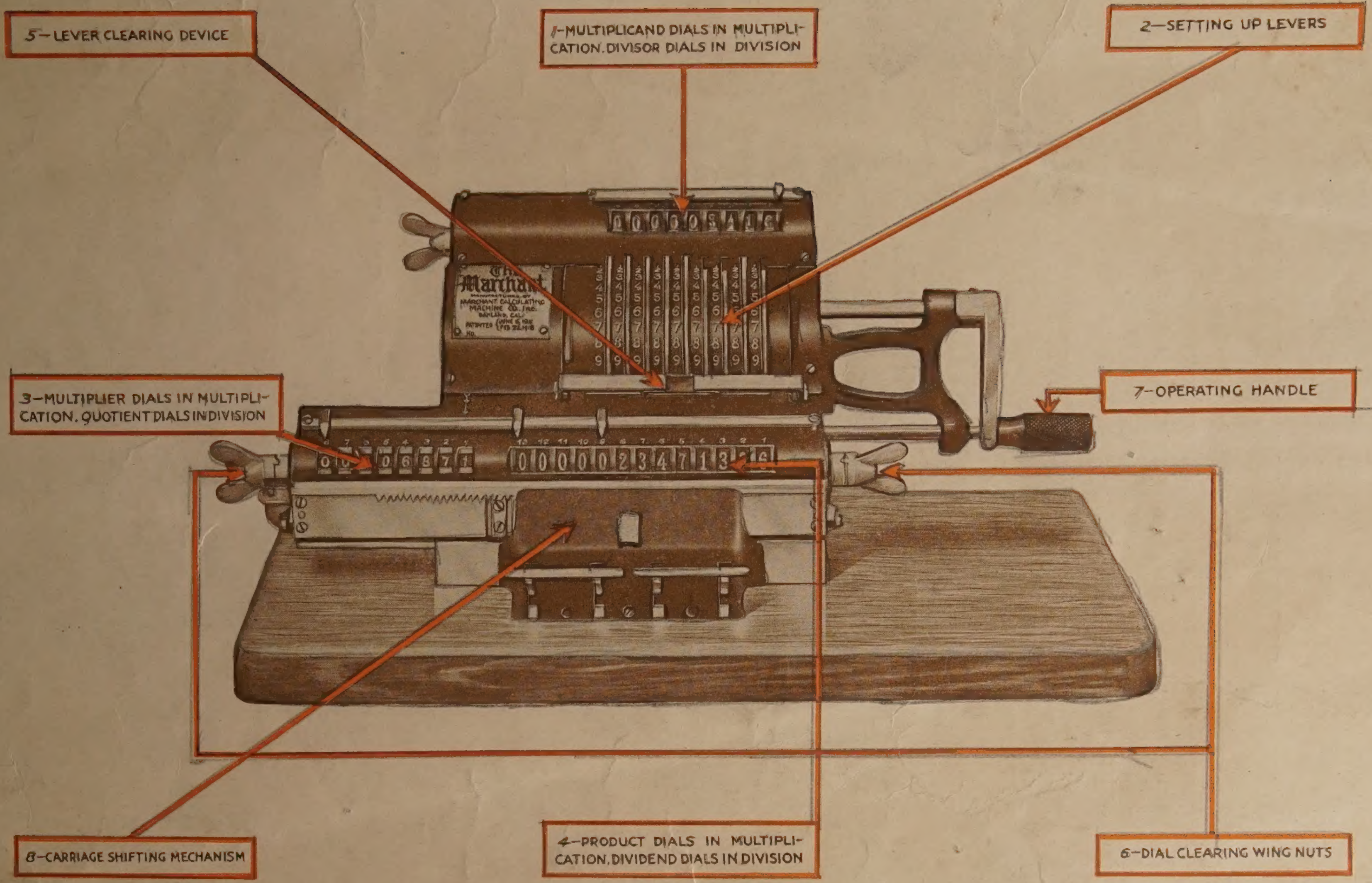
5—LEVER CLEARING DEVICE
1—MULTIPLICAND DIALS IN MULTIPLICATION. DIVISOR DIALS IN DIVISION
2—SETTING UP LEVERS
The Marchant
3—MULTIPLIER DIALS IN MULTIPLICATION. QUOTIENT DIALS IN DIVISION
7—OPERATING HANDLE
8—CARRIAGE SHIFTING MECHANISM
4—PRODUCT DIALS IN MULTIPLICATION, DIVIDEND DIALS IN DIVISION
6—DIAL CLEARING WING NUTS

Fig. 1.

GENERAL INSTRUCTIONS

In operating the MARCHANT do not place the machine directly in front of the operator, as in turning the handle there is too much of an arm movement. The proper position is to slant the machine so that the lower right hand corner is before you and slightly to right of operator, in this way getting a speedier wrist movement.

SETTING UP LEVERS

The levers operating over curved face of machine are used to set number on machine by pulling levers downward until opposite figures to be used. Use the left hand and index finger in setting up levers.

SETTING FIGURES ON LEVERS

In placing a number on the setting-up levers: First, see how many figures you have in same; second, commence setting number at the corresponding figure at the top of machine. Example: Set 25476 on the machine. This number contains five figures, therefore set the first figure or 2 in the fifth column, the second figure or 5 in fourth column, etc.

With a little practice this setting up from left to right is much quicker than setting up from right to left. By setting and operating from left to right you can with a little practice retain a large number in your mind. It is also of great advantage in using short-cuts as explained further on.

TOP REGISTER DIAL

(Special Feature Pony Machine)

The Top Register Dial gives a complete check on the numbers placed on set-up levers. Pony Machines are furnished with or without this feature, as the purchaser desires.

CORRECTING NUMBER SET WRONG ON LEVERS

After setting the number on the levers turn the handle forward one stroke, throwing the figures into the Product Dials, thus checking figures set up.* If mistake has been made, reverse handle action, reset lever that is wrong, and continue with operation.

CARRIAGE DIALS

In Multiplication the dials on the left hand side of the Carriage are the Proof Dials and are used to register the revolutions of the Handle; in other words, they show the number of times the amount placed on the Setting-Up Levers is multiplied, thus giving the multiplier and proving the operation.

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* Not necessary on Pony Special model.

The right hand, or Product Dials, automatically produce the Product. In Division, the Quotient automatically appears in the left hand dials, and the Dividend is shown in the right hand dials. These dials are numbered from right to left so that in setting a decimal point you must count from the right hand side of dials. When a red figure appears in the left hand dials it denotes Subtraction.

SPACING CARRIAGE

To space carriage one way or the other simply press down hard on small space bar at front of machine, using right or left bar according to direction you wish carriage to move. If it is desired to throw carriage a number of spaces pull forward small thumb piece just above space bars and push carriage over by hand.

POSITION

What is meant by 1st position, 2nd position, 3rd position, etc.?

In examples given in this book you will be instructed to "space carriage to seventh position, or fifth position, etc.," which means to shift the carriage until the designating arrow (see page 6) points to the position called for, the numbers being shown just above the dials. **Don't confuse the decimal indicator with the arrow.**

HANDLE

On commencing to operate machine, pull handle outward so as to remove the spindle inside of handle from its socket and hold same in this position while turning handle. Make forward turn for multiplication or addition and reverse turn for subtraction or division. It is very important that you make a complete revolution of handle before attempting to reverse; for instance, you are multiplying a number by four and by mistake start a fifth stroke and get half way around before noticing mistake; do not try to turn handle back at once, but complete the stroke you are making, then reverse handle. At the finish of multiplication by each separate figure allow handle to return to socket, otherwise carriage cannot be shifted.

CLEARING MACHINE

Before starting an operation be sure and see that the various dials and levers are cleared. In clearing left and right hand dials of the carriage, make one complete forward revolution of the clearing wing nuts at each end of the carriage, **and be sure that these clearing wing nuts are thrown into position and fit into the sockets at finish of the revolution.** To clear setting levers on Standard machine, pull clearing comb to left and turn handle half turn forward, then release comb and complete stroke—on Pony machines use thumb on outer edge of thumb piece and force levers back to zero.

ARROW

The small white enameled arrow placed on body of machine just above the left hand or proof dials, is used to designate the position at which machine is operating:

	4	3	2	1
etc.	thousands	hundreds	tens	units

DECIMAL POINTS

The small sliding blocks just above the carriage dials are used for placing decimals. In multiplication place off the same number of decimal places in the right hand, or Product dials, as you would if figuring the problem by hand. Example: $2.45 \times 3.475 = 8.51375$. Mark off five places by placing the decimal point to the left of column No. 5.

In Division the rule for placing decimal point in the quotient is: Subtract the number of decimal places in the Divisor from the number of places to the right of the decimal point in the Dividend as it appears in machine, and point off the resulting number of places in the Quotient. In Division the Dividend appears in the right hand dials, and the Quotient in the left hand dials of the carriage.

NOTE: Additional ciphers on **right** of any number, whether in Setting, Product or Multiplier dials, must always be taken into consideration as additional decimal places. Thus, if 5.69 was in Product dial as 5.690,000 it would be necessary to read this as six decimal places and not two.

DESCRIBING THE SIMPLER OPERATIONS IN MATHEMATICS

ADDITION

Example:
245
3,275
84

3,604

Space carriage to unit position (arrow pointing to column No. 1 of left hand dial). Place 245 on machine, pulling third lever to 2, second lever to 4, and first lever to 5, using left hand, index finger, for this purpose. Turn handle forward one stroke. Clear levers. Set up 3,275 in same manner. Turn handle and clear levers. Repeat this operation until all the numbers have been added into the machine. Total amount will be accumulated in the right hand dial.

SUBTRACTION

Example:
24,567
13,245

11.322

Space carriage to unit position. Place 24,567 on machine, pulling fifth lever to 2, fourth lever to 4, third lever to 5, second lever to 6, and first lever to 7. Turn handle forward one stroke as in addition. Clear levers and set up 13,245, the number to be subtracted, and give a backward or reverse turn to the handle. The answer appears in the right hand dial.

MULTIPLICATION

Example: 5 × 5 = 25

Shift carriage to first, or units position, pull first lever to 5, and turn handle forward five times. Number 5 will show in the left hand or Multiplier dial, and 25 in right hand or Product dial, thus giving the multiplier, multiplicand and product, and proving the operation.

Example: 24.5 × 52.81 = 1,293.845

Place 5,281 on the machine. Then shift carriage to third position (because the multiplier has three figures), and turn handle forward two times; shift carriage to second position and turn handle forward four times; shift carriage to first position and turn handle forward five times, completing the operation. In order to check the operation, see that you have the proper figures set on the levers—(Pony Special has top dial, showing amount set up)—and the proper multiplier appearing in the Proof dial. Three places in the Product dial should be pointed off with decimal pointer as would be done on paper without a calculator.

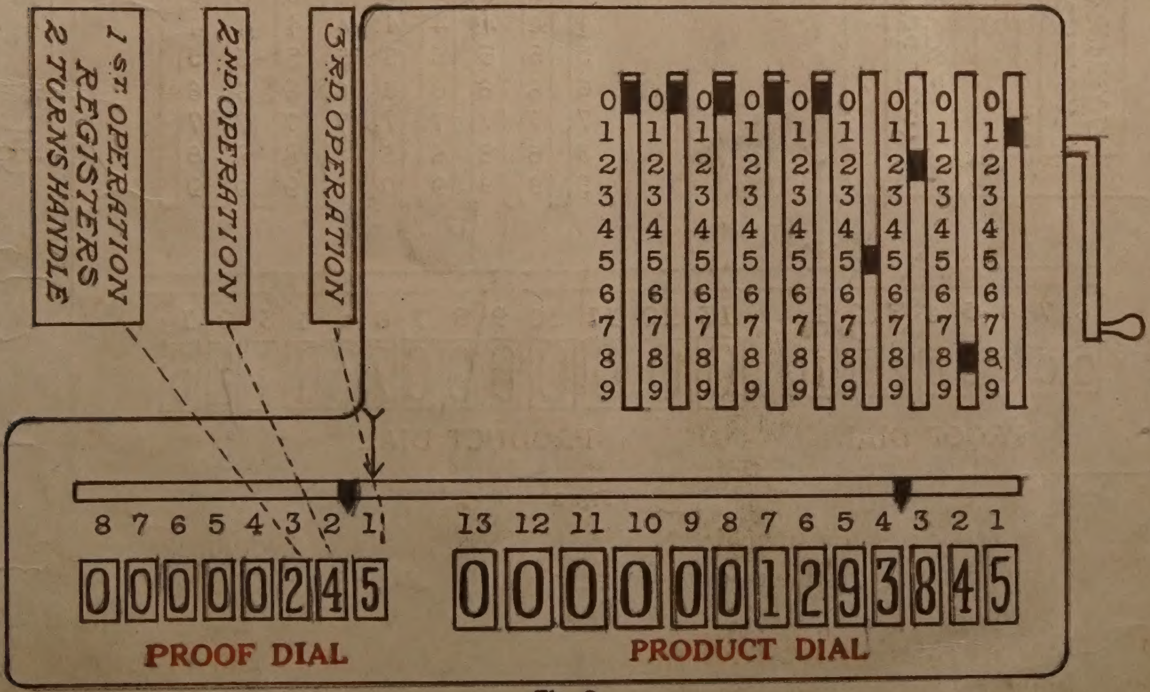

Fig 2

CORRECTING ERRORS IN THE MULTIPLIER

If, in checking the above operation, you find that you have made a mistake and multiplied by, say, 254 instead of 245, **do not** clear machine and repeat operation, but space the carriage to column No. 2 and by one reverse turn of the handle reduce figure 5 to 4—then space carriage to column No. 1 and give a forward turn to handle, raising 4 to 5—correcting mistake.

POINTING OFF OF DECIMALS IN MULTIPLICATION

To point off decimal places, add the number of places in the multiplier (as shown on machine) to number of places in multiplicand (as shown on machine); additional ciphers shown in machine to right of figure required must be read as decimals.

SHORT CUT METHOD OF MULTIPLICATION

Example: 199 × 3,674 = 731,126

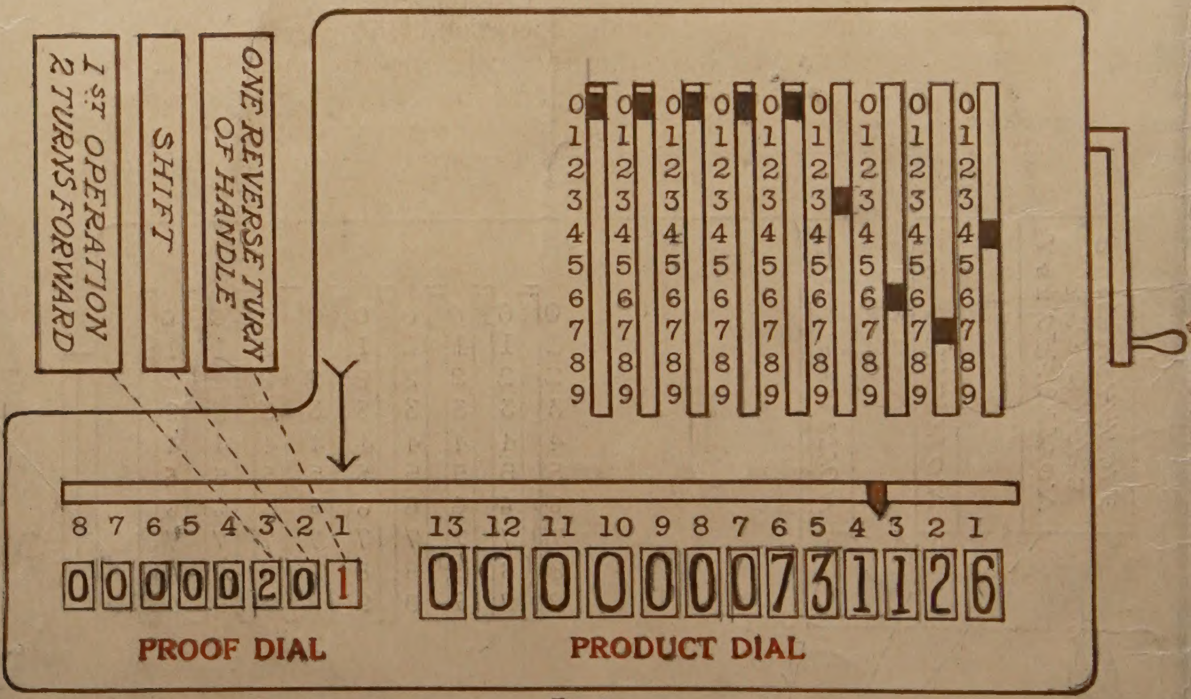

Fig. 3

Set 3,674 on machine, shift carriage to third position; turn handle forward twice—that is, multiply by 200; then shift to first position; turn handle backwards once. The last number will appear in red showing you have subtracted. You have multiplied by 200 minus 1, which is equivalent to 199.

In multiplication of 7 figures by 1 figure, 6 by 2, 5 by 3, 4 by 4, *i. e.*, 8,573,825 × 7; 721,190 × 26, etc., a method can be sometimes used to advantage, whereby the left hand or Multiplier dial is not used, and thus eliminating clearance of this dial with left hand:

Set ninth lever at 1, and decimal pointer between 8th and 9th position in Product dial; then the Multiplier is shown to the left of the decimal pointer and both Multiplier and Answer can be cleared with one motion from Product dial. This is particularly effective where short cut method is used, as 199 would appear as 199 and not 201.

USING TWO SHORT CUTS IN MULTIPLICATION

Example: 17,365 × 3,949

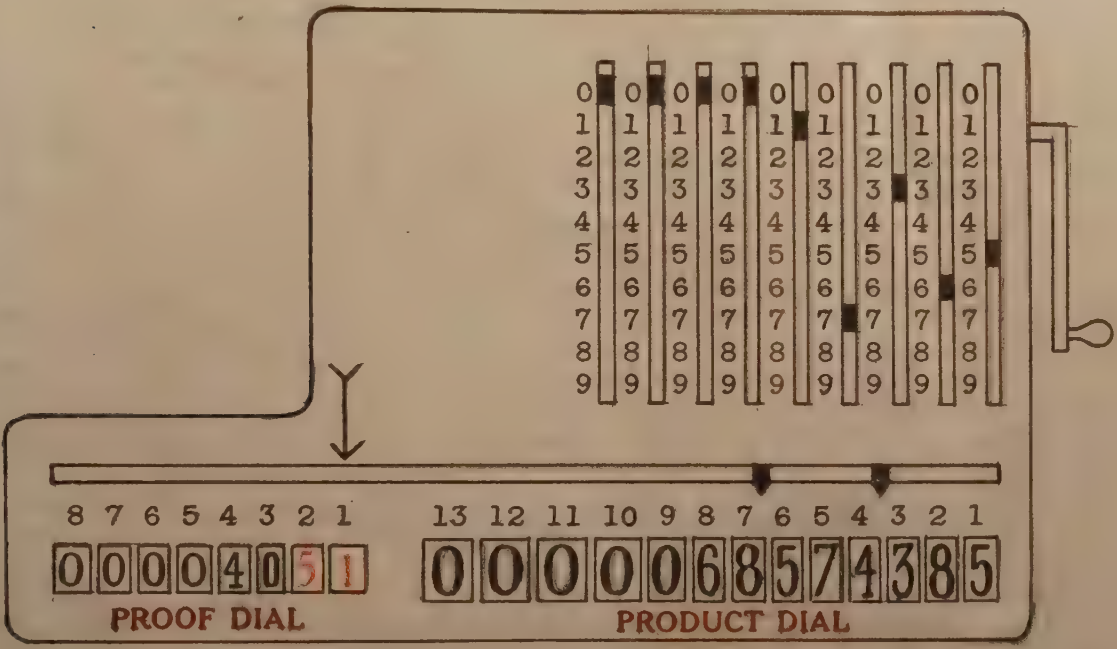

Fig. 4

The above example offers the opportunity to use two short-cuts sometimes overlooked by most experienced operators. Instead of multiplying by 3,949 we multiply by 4,000 minus 50 minus 1; make 4 forward turns of the handle in the fourth position; 5 reverse turns of the handle in the second position; and 1 reverse turn of the handle in the first position.

In multiplying by any number having one or more 9's, 8's, or 7's, always use this subtraction short-cut method.

EXAMPLES IN MULTIPLICATION IN WHICH SHORT CUTS CAN BE USED

1

25 × 9 = 225
(10-1)

2

1,545 × 98 = 151,410
(100-2)

3

18,654.56 × 49.29 = 919,483.2624
(5,000-100 + 30-1)

	8	7	6	5	4	3	2	1		3	2	1
543,217 × 97,159	0	0	1	0	3	2	4	1	or	1	6	1
560,725 × 89,987	0	0	1	1	0	0	1	3				
74,286 × 79,819	0	0	1	2	0	2	2	1				
46,576 × 897	0	0	0	0	1	1	0	3				

When one has a series of high figures in the multiplier, it is a good plan to mentally group them between any low numbers which may intervene; then reading from left to right (the natural way) one mentally subtracts the high number from 10. Where there are two or more high numbers subtract all but the last one on right from 9.

For example, multiplying by 87,297.18:

One mentally groups, first, 87, to be subtracted from 100, or 13, or subtract, first, the 8 of the 87 from 9, giving 1, and then the 7 from 10, giving 3; next 297 from 300 gives 3, the 9 subtracted from 9 is cancelled and the 7 from 10 gives 3; the last subdivision 18, or 20 less 2; to illustrate:

8th	position	1	turn	forward
7th	"	1	"	reverse
6th	"	3	"	"
5th	"	3	"	forward
4th	"	0		
3rd	"	3	"	reverse
2nd	"	2	"	forward
1st	"	2	"	reverse

1 1 3 3 0 3 2 2

MULTIPLICATION BY A CONSTANT

Example:

245 = 8,514,240
3,566 = 123,925,632
1,478 × 34,752 = 51,363,456
33,357 = 1,159,222,464
2,448 = 85,072,896

Set the constant multiplicand, 34,752, on machine, and multiply by 245—Answer = 8,514,240—**Do not** clear machine for next operation but **interchange** in your multiplier; 245 is in the Proof dial and the next figure is to be 3,566; carriage is spaced to Position No. 4 and handle turned forward three times; to Position No. 3 and handle turned forward three times, which will raise the number 2 already in the machine to 5; to position No. 2, and 4 is raised to 6 by two forward turns of the handle; to position No. 1, and 5 is raised to 6. 3,566 is seen to be the new multiplier and the new answer is 123,925,632.

In the next example, space carriage to the fourth position and **reverse** handle two strokes, thus reducing 3 to 1—space to third position and reverse one stroke—space to second position and add one stroke—space to first position and add two strokes, changing multiplier to 1,478 and getting new answer 51,363,456. Continue balance of operation in same way. This reduces the number of strokes to be made and saves clearing the dials after each separate operation.

This method will be found exceptionally useful in figuring:

Percentage
Pay Rolls
Taxes
Statistics
Street Assessment Work
Engineer's Traverses
Chain Discounts
Foreign Exchange
Interest
Obtaining acreage from sq. ft.
Pro-ration
Adding or deducting % from amounts, etc.
Changing to Metric System and vice versa

MULTIPLICATION AND TOTAL ADDITION

Example:

157 × 3.27 = 513.39
435 × .18 = 78.30
4,210 × 5.60 = 23,576.00

24,167.69

To prove an invoice or check work already done, allow the sum to accumulate in the machine, it not being necessary to check each separate item as long as the total is correct.

Set 327 on the machine and multiply by 157—clear Proof dial, allowing the product to remain. Set up 435 and multiply by 18—clear Proof dial; set up 4,210 and multiply by 560; the grand total in the dial will read 24,167.69

MULTIPLICATION OF FRACTIONS

Reduce fraction to decimal equivalents as per table on Page 34 and multiply in ordinary manner, using the decimal marker to point off the total number of decimal places in the two numbers multiplied.

Example: $\frac{3}{4} \times \frac{5}{8}$ $(.75 \times .625) = .46875$
Example: Multiply $12\frac{1}{4} \times 37\frac{1}{8}$

$$12\tfrac{1}{4} = 12.25$$
$$37\tfrac{1}{8} = 37.125$$

Where many fractions are being constantly met with, it is advisable to have a table prepared on a slip of paper, handy to the operator, so that the decimal equivalent of any fraction used can easily be picked up by the eye (see Page 34).

DIVISION

There are two systems of division used on the "MARCHANT"—Division by Multiplication, and Division by Subtraction.

Division by Multiplication is the fastest method known, and in most cases is preferable to the Subtraction method.

To illustrate the two methods in as simple a manner as possible, we will divide 25 into 100.

Multiplication Method: Set the divisor 25 on levers, space carriage to units column, and turn handle of machine forward as in addition, watching the Product dials for 100, the dividend, to appear. In four forward turns you have 100, and the quotient 4 is shown in the left hand dials.

Subtraction Method: Set the Dividend 100 on levers and add same into machine by one forward turn of handle, clear the left hand dial of the figure 1. Clear the levers and set up Divisor 25, then **reverse** the handle action. In four backward turns, the Dividend 100 has been taken from the lower dials and the quotient 4 appears in left hand dials, showing that 25 has been subtracted 4 times from 100.

The Addition method has the added advantage of providing a complete check at the end of the operation—Divisor, Dividend and Quotient being visible.

DIVISION BY ADDITION

Example No. 2: $9874 \div 24$.

Place 24 on the levers. Space carriage to column No. 7—(when doing regular division work it is a good plan, although not an arbitrary one, to space carriage to 7th column, so that answer can, if necessary, be carried out seven decimal places). Now turn handle forward slowly and watch for 98, the first two figures to be divided (paying no attention to any figures that may appear to the right of columns that the figures 98 are to be accumulated in, as we must first get these two figures before turning our attention to the next two (74)—

In the first turn we get (24)000000—second turn (48)000000—third turn (72)000000—fourth turn (96)000000.

Now space carriage one place to the left, as you can readily see that one more turn of handle would raise the number above 98, in which case you would have to reverse handle and space carriage over.

Turning handle forward first stroke in new position we get (9840)0000—second turn (10080)0000, which is over (9874)0000, so reverse handle one stroke and space carriage one place to the left.

Turning handle forward first stroke gives (9864)0000. Shift one place to the left and the first turn gives (9866)4000—second stroke (9868)8000—third stroke 98(71)2000—fourth stroke 98(73)6000.

Space carriage one place to left, as you can see another turn would carry over 74. First stroke 98(73)8400—second (9874)0800, which is the number we are looking for. The remainder 0800 is a little over the dividend, but not enough to affect answer. In case you wish to carry answer out further, simply reverse handle one stroke, space carriage to left, and continue as before.

Now see rule at front of the book for placing decimal in the quotient. Placing the decimal in the Dividend will give us 9874.0800. As there are no decimal places in the Divisor, we will point off the same number of decimal places in the quotient as appear to the right of the decimal point in the Dividend, which is four. Pointing off four places in the quotient dials, counting from right hand side of same, gives us answer 411.42.

Example No. 3: 6787.59 ÷ .23598.

Set divisor 23598 on the levers, space carriage to column No. 7. First turn of handle we get (23)598000000—second turn (47)196—third (70)794—too much, so reverse handle and space carriage to left.

In new position, first turn (49)5558—second (51)9156—third (54)2754—fourth (56)6352—fifth (58)995—sixth (61)3548—seventh (63)7146—eighth (66)0744. Space carriage to left—first turn (66)—second (66)—third (66)—fourth (67)—

Now, as you have the first two figures, place your attention on the next two spaces.

First turn 67(25)—second 67(49)—third 67(72)—fourth 67(96)—too much, so reverse and space over.

First turn 67(74)—second 67(77)—third 67(79)—fourth 67(82)—fifth 67(84)—sixth 67(86)—space over.

First 6787(02)—second 6787(25)—third 6787(49)—fourth 6787(72)—too much, so reverse and space over.

First 6787(51)—second 6787(53)—third 6787(56)—fourth 6787(58).

Space to left—first turn 6787(58)—second (678759)18516.

You have now accumulated your Dividend, so place the decimal pointer on machine at same place it occurs in the dividend in your example, that is, after 6787.—giving 6787 5918516.

Now subtract the number of decimal places in your divisor (five decimal places) from the seven places appearing to the right of the decimal point in the Dividend and point off the result in the quotient. Answer equals 28763.42.

The key note of Division by Addition is this: When you have turned handle until the figure accumulated is greater than the figure you are looking for, reverse handle and space carriage one place to the left. Watch for your Dividend in groups of two figures each. If red figures appear in answer, clear machine and start over, because this shows carriage has been spaced too soon or too late.

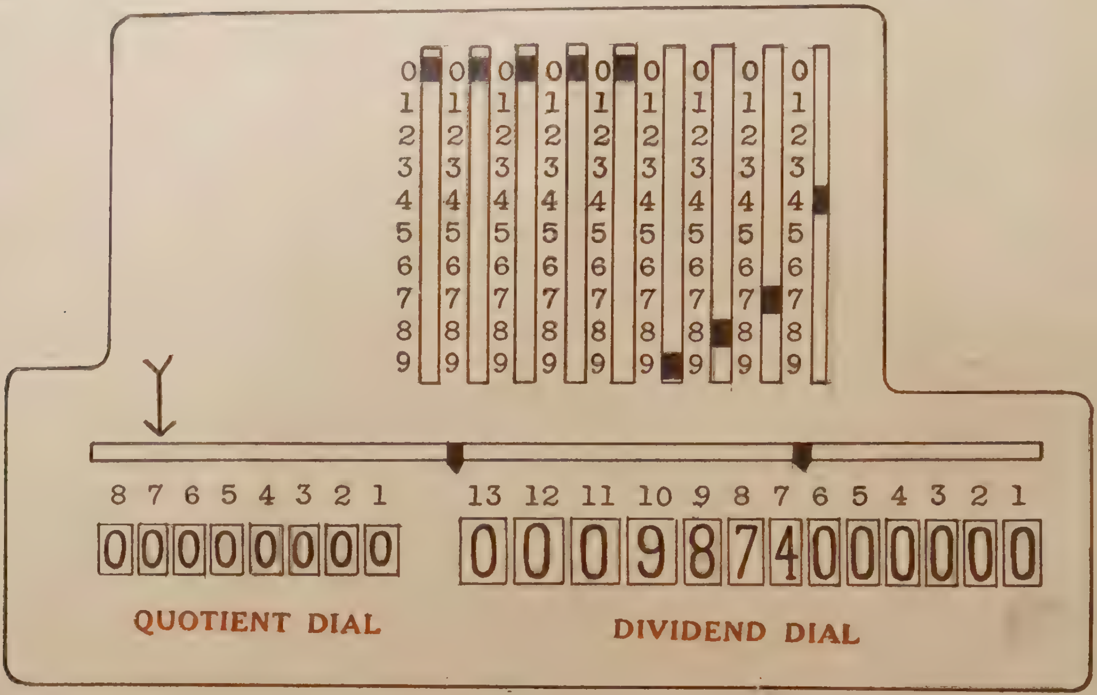

Fig. 5
First position in dividing 9874 by 24: Placing Dividend into Dividend dial.

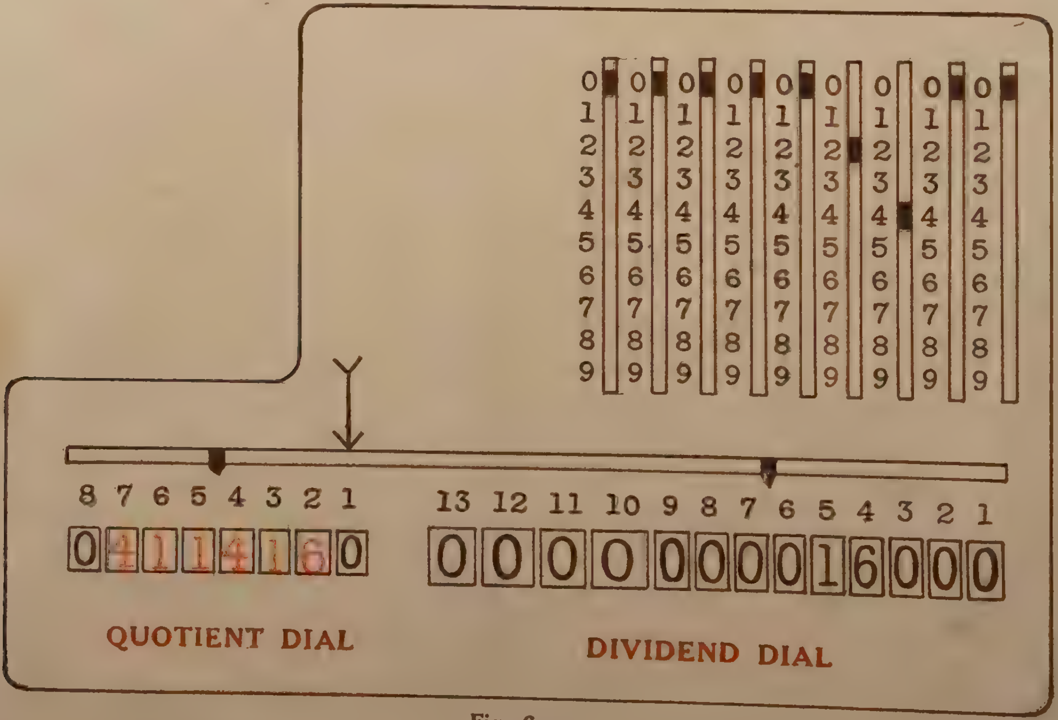

Fig. 6
Last position in process: Showing Answer to be 411.416 and .016 remainder.

DIVISION BY SUBTRACTION

Get Dividend into the Dividend Dial (Product Dial in multiplication) by setting up levers in usual manner. As the answer or quotient is to appear in Quotient Dial (Proof Dial in multiplication) the carriage must be spaced to a position that will permit of a sufficient number of decimal places being carried out—usually the 6th, 7th or 8th position is proper.

The Divisor is then set up on the machine in a position that will permit of subtracting it from the Dividend, commencing with the left hand figures of the Dividend. It will be noticed that the bell will ring if the Divisor is subtracted too many times at any position; handle is then reversed (bell ringing again) and carriage spaced to next position, when subtraction operation is repeated. The continuing of subtracting until bell rings is not necessary, and by watching each respective group of figures in the Dividend being worked on, one can, with a little experience, stop immediately, the group becomes less than the Divisor. However, by running until bell rings and correcting the operation is more or less automatic and sometimes has advantages on that account.

Example: 9874 ÷ 24

Set 9874 on machine, space carriage to 7th position and throw this amount (which is the Dividend) into Dividend Dial; move decimal marker so that 9874 is read as 9874 and not 987400, etc.; *i. e.*, slide marker to point between 7th and 6th positions on Dividend Dial.

Now clear levers and left hand dial, set up 24, using the 4th and 3rd levers respectively for this purpose in order that subtraction may be made from 98, the first operative group of the Dividend. Now while actually dividing by 24, as previously explained, the ciphers to right must be taken into consideration as decimal places. The Divisor on machine is therefore read as 24.00, and following the rule for pointing off decimals in division, the 2 places in the Divisor must be subtracted from the 6 places shown in Dividend (9874.000000). This leaves 4 places to be pointed off in Quotient Dial.

(NOTE: It is usually a good plan to point off in Quotient Dial before commencing the actual process of Division, as it is thus possible to see the answer appearing with correct decimal and to stop when enough places have been reached.)

The actual process of reducing the Dividend is now commenced and the handle is reversed 4 times, the first group of the Dividend, viz. 94, being reduced to 2; carriage is now spaced to 6th position and the Divisor subtracted from the new group of two figures, viz. 27, one reverse turn reducing it to 3; carriage is spaced to 5th position and 34 reduced to 10; carriage is spaced to 4th position and 100 reduced to 4; carriage is spaced to 3rd position and 40 reduced to 16; carriage is spaced and 160 reduced to 16; the remainder being exactly 16 twice running, denotes a recurring decimal and it is therefore unnecessary to carry out any further. The **Answer** or number of times 24 has been subtracted away from 9874 appears in Quotient Dial as 411.416 in red. **Subtraction method answers are always in Red, excepting 0's and 9's, which are white.**

It may be noted here that it will sometimes be necessary to space carriage two positions before getting a new group of figures from which the Divisor can be subtracted. This happens when the last group has almost been reduced to nothing.

COMBINED MULTIPLICATION AND DIVISION

Example: 2456 × 34758 ÷ 2734 = 31223

First multiply as usual, leaving product in machine. Clear the left hand dials and the levers and set up the divisor. Shift carriage until the 2 of the divisor is just over the first figure that appears in the lower dials and then divide by Subtraction, reversing handle action.

DIVISION BY A COMMON DIVISOR

In dividing a number of figures by the same Divisor the best system is to get the Reciprocal, or co-efficient, of the Divisor and multiply.

Getting the reciprocal of a number is dividing the unit 1 by the number. This gives us a decimal that we can multiply by and get the same result as though we had divided by the number.

Example:

765 = .03113
3,546 = .14430
6,374 = .25938
3,258 ÷ 24,574 = .13258
24,765 = 1.00777
2,955 = .12025
874 = .03557

Divide the unit 1 by 24,574 = .000,040,693,42

Set 4,069,342 on the levers, point off 11 places in the Product Dials, and multiply the various figures beginning with 765, as described in MULTIPLICATION BY CONSTANT

DIVIDING UNIT 1 BY A NUMBER

Method (A) If done by Addition method, set up your divisor 24574, space carriage to seventh column and turn handle forward one stroke. Now place the decimal indicator to the left of the first figure of the number appearing in the Product dials, which is 2 in this case, giving .24574000000; the idea now is to add this divisor into the machine until the figure 1. appears to the left of the decimal point we have placed on the machine.

We have already added one turn into the machine, so continuing the operation and watching for the 1. we find in five turns we get 1.22870000000, which is over the amount, so reverse handle one turn and space over to left—in one turn we get more than the figure 1. again, so reverse and space over. Continue until you have carried your answer out about six or seven places.

Pointing off: There are 11 places to the right of the dividend (the figure 1.) and as the divisor is a whole number with no decimal places we will point off eleven places in the answer. This gives us .00004069342.

In getting this reciprocal by SUBTRACTION method, space carriage to column No. 7 on small machine, set the dividend (the unit 1.) on lever No. 7, add same into machine, place decimal indicator after the figure 1, and clear left hand dials of the figure 1. Now clear the levers and set up Divisor 24574, setting the 2 on lever No. 6, the 4 on lever No. 5, etc., this in order to get the Divisor to the right of the unit 1. when commencing the subtraction, and continue as per directions given.

Method (B) Set up 24,574 on levers No. 1 to No. 5, set up 1 on lever No. 6, mark off 11 places in right hand dial, shift carriage to 7th position.

One forward turn of handle registers 1.245 740 000 00 in right hand dial; push back the 1 on lever No. 6 to 0, then reverse operating handle, which clears 1 from left hand dial and leaves 1.000 000 000 00—also the 24,574 on levers is in correct position for direct subtraction. Reverse handle until bell rings, which signifies it cannot be subtracted another time and you must turn handle forward to original position, then shift and repeat operation. By subtraction method we obtain .000 040 693 42. (This method is preferable in that the possibility of the novice leaving a 1 in left hand dial is eliminated.)

Note.—The rule which determines decimal points in reciprocal; *i. e.*, "Prefix as many ciphers to the reciprocal as there are whole digits less one in original number."

EXPLANATION: 24574 = 5 digits minus one = .000 040 693 42
2457.4 = 4 " " " = .000 406 934 2
245.74 = 3 " " " = .004 069 342
24.574 = 2 " " " = .040 693 42
2.4574 = 1 " " " = .406 934 2

DISTRIBUTION AND PERCENTAGE

	Sales	Distribution	Percentage
Dept. A	$ 640.19	$ 125.00	4.1369
Dept. B	1,282.68	250.45	8.2886
Dept. C	6,430.33	1,255.55	41.5525
Dept. D	3,330.79	650.35	21.5234
Dept. E	3,791.21	740.25	24.4986
Total	$15,475.20	$3,021.60	100.%

In the above example, the sales of five departments amounted to $15,475.20, at a cost of $3,021.60, this amount to be prorated among the various Depts. according to amount of sales in each Dept., results to show actual amount of expense charged to each Dept. and percentage of same.

First—By dividing the total amount of sales into total amount of expense, we arrive at the amount of expense necessary to do $1.00 worth of business, giving a result of $.1952544.

Second—Set this amount on the upper levers as a constant multiplicand, multiply by 640.19, getting $125.00, then WITHOUT CLEARING THE MACHINE, change multiplier 640.19 to next multiplier 1282.68 as described in "Multiplication by Constant," and continue.

Our next example is to get the percentage of each separate amount of expense to the total amount of expense, a matter which is ordinarily handled in the absence of a calculating machine by dividing this total amount of expense 3021.60 into each separate amount. Instead of working out the example in this manner, find the percentage of $1.00 to the whole by dividing 3021.60 into 1.00 as described in "Dividing the Unit 1 by a Number." This gives us a result of .0003309505.

Now, as we have the percentage on $1.00, in order to get the percentage on $125.00, simply set up .0003309505 as a constant multiplicand, and multiply same by 125.00, changing 125.00 to 250.45 for next result, and continue as described in example above.

All Auditors of Large Corporations, such as Public Service Corporations, Railroads, Gas and Electric Power Companies, Telephone Companies, Department Stores, Lumber and Steel Companies, etc.

PRO-RATING

Pro-rate $125.73 freight charges on shipment of 5331 pounds to the various departments as follows:

Department	A	1252	lbs.		=	$ 29.53
"	B	1378	"		=	32.50
"	C	565	"	× .0235846	=	13.32
"	D	753	"		=	17.76
"	E	842	"		=	19.86
"	F	541	"		=	12.76
		5331	"			$125.73

Divide $125.73 by 5331 in order to get the freight charges on 1 pound, or the cost on $1.00, as the case may be.

Result .023,584.6—Set this result on machine, point off seven decimal places and multiply by 1252, etc., as in MULTIPLICATION BY CONSTANT.

INTEREST

The Marchant method of figuring interest is particularly simple and accurate, giving a direct operation much speedier than the pencil method, and doing away with the unhandy method of figuring by interest table book, besides giving a positive proof of each example as it is completed.

The principle used is as follows:

Amount × interest on $1.00 for any number of days, at the required rate of interest.

Example: Find the interest on $24,564 for 30 days @ 7%.

The interest on $1.00 for 30 days @ 7% equals .005,833,33 (see interest table for interest on $1.00 at various rates for 30 days). Set 583333 on machine, point off eight places and multiply by 24564. Answer, 143.29. Done in eight seconds with proof.

We will gladly furnish on demand tables giving the interest on $1.00 at any desired rate for from one day to six months. These tables are printed each per cent on a convenient size card, and can be used very handily, as there are no pages to turn as in the ordinary interest book.

INTEREST TABLE SHOWING THE AMOUNT OF INTEREST ON $1.00 FOR ONE DAY AT THE VARIOUS RATES GIVEN

360-Day Basis

1%	.000 027 777 78	1½%	.000 041 666 67
2%	.000 055 555 56	2½%	.000 069 444 44
3%	.000 083 333 33	3½%	.000 097 222 22
4%	.000 111 111 11	4½%	.000 125 000
5%	.000 138 888 89	5½%	.000 152 777 78
6%	.000 166 666 67	6½%	.000 180 555 56
7%	.000 194 444 44	7½%	.000 208 333 33
8%	.000 222 222 22	8½%	.000 236 111 11
9%	.000 250 000 00	9½%	.000 263 888 89
10%	.000 277 777 78		

365-Day Basis

1%	.000 027 397 26	1½%	.000 041 095 89
2%	.000 054 794 52	2½%	.000 068 493 15
3%	.000 082 191 78	3½%	.000 095 890 41
4%	.000 109 589 04	4½%	.000 123 287 67
5%	.000 136 986 30	5½%	.000 150 684 93
6%	.000 164 383 56	6½%	.000 178 082 19
7%	.000 191 780 82	7½%	.000 205 479 45
8%	.000 219 178 08	8½%	.000 232 876 71
9%	.000 246 575 34	9½%	.000 260 273 97
10%	.000 273 972 60		

NOTE: Seven places only need be taken for accurate results on amounts up to $99,999.99.

NEW INTEREST METHOD

It is not necessary to use any of the tables when the amounts are under $5,000, and the time does not exceed 180 days. The average interest calculations will be within this scope. Take these examples:

$125 at 6 per cent for 35 days. $125 at 5 per cent for 35 days.

In the above examples you would take the 5% and 6% tables, set 58333 for the 6%, or 48611 for the 5% and multiply by 125. This is quick and easy; but as you know that many operators object to using tables, etc., use the following method:

The reciprocal of .00016666 or interest on $1.00 for 1 day at 6% is 6000. In other words, if you divide (125 × 35 days) by 6000 you will get the same result as if you multiplied 125 × 35 × .00016666. Then set the days on the right hand end of the machine, bringing down the first two levers to 35. Next set your reciprocal of the rate (6% = 6000) at the extreme left end. You will pull lever 9 to number 6. Shift carriage to the 4th position and simply divide 125 by the addition method. In nine turns you have produced 125.04 on the machine, which is close enough. If you don't do it in 9 turns you are missing a short cut. Set decimal point after 125, giving ten decimals to the right. You have been dividing by 6000 not 6, so you have 5 decimals in your divisor. Subtract 5 from the 10, giving 5 decimals in your result—.72940 or 73 cents, shown at the right end of the carriage.

Suppose you had another item at 6%—$75.00 for 37 days. Simply clear dials, change 35 to 37, leave the 6 on the machine and in 4 seconds you have the next result or .46 on the machine.

5%—7200 reciprocal. Set 72 instead of 6. Set 35 as in the 6% example. Shift to the 4th position and produce 125 on the machine. 124.99 is close enough. The result is 61 cents interest, five decimals from the right pointed off.

185.50 @ 2¾% for 63 days. The reciprocal is 13091, so use 13100 or you will not have room on the present machine. The slight difference in interest is not important enough to notice. Set 63 at right end and 131 at left end. Shift carriage to the 4th place and produce 185.50. When finished you will have 1416 in left dial and 185496089208 in the product dial. Set decimal pointers after the 185 making $185.496. You will note there are 9 decimals to the right of the 185. Your divisor is 13091, although you have been dividing by 13100. This leaves 4 decimals in your divisor which subtracted from the 9 in your dividend leaves 5 places in the result. Set decimal in interest result and you have .89208. Proof of this pointing off can be had as follows: Your example is 185.50 ÷ 13091 = .01416.
.01416 × 63 = .89208.

Practice this new method and you will find it very quick and even more accurate than a table method. You have a proof with every calculation and all you need is to know and keep a few reciprocals at your command.

Reciprocals

1%	36000	1¼%	28800	1½%	24000	1¾%	20572
2%	18000	2¼%	16000	2½%	14400	2¾%	13091
3%	12000	3¼%	11077	3½%	10286	3¾%	9600
4%	9000	4¼%	8471	4½%	8000	4¾%	7579
5%	7200	5¼%	6857	5½%	6545	5¾%	6261
6%	6000	6¼%	5760	6½%	5538	6¾%	5333
7%	5140	7½%	4800	8%	4500	8½%	4235
9%	4000	9½%	3789	10%	3600		

MAKING AN INTEREST TABLE

To make up a table at any required rate of interest, set up on machine the interest for one day at the required rate given in table above, point off 11 places in the Product dials. In one turn of the handle you have the interest for one day—second turn the interest for two days, etc. It is usually only necessary to carry your decimal out to seven places. If a number of different rates are used it is a good plan to have the tables printed on various colored papers.

Following is example of how to make the table at 5%:

Days.	One Month and	Two Months and	Three Months and
1 .000 138 888 89	1 .004 305 55	1 .008 472 22	1 .012 638 89
2 .000 277 78	2 .004 444 44	2 .008 611 11	
3 .000 416 66	3 .004 583 33		
4 .000 555 55			
5 .000 694 44	continue to 30 days.		

TABLE TO DETERMINE DAYS

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Jan........	365	31	59	90	120	151	181	212	243	273	304	334
Feb.......	334	365	28	59	89	120	150	181	212	242	273	303
Mar.......	306	337	365	31	61	92	122	153	184	214	245	275
April....	275	306	334	365	30	61	91	122	154	183	214	244
May.......	245	276	304	335	365	31	61	92	123	153	184	214
June......	214	245	273	304	334	365	30	61	92	122	153	183
July......	184	215	243	274	304	335	365	31	62	92	123	153
Aug.......	153	184	212	243	273	304	334	365	31	61	92	122
Sept......	122	153	181	212	242	273	303	334	365	30	61	91
Oct........	92	123	151	182	212	243	273	304	335	365	31	61
Nov.......	61	92	120	151	181	212	242	273	304	334	365	30
Dec.......	31	62	90	121	151	182	212	243	274	304	335	365

To calculate the days when the date in each month is different, add or subtract the differences between the two dates of each month.

Jan. 5 to June 5 = 151 days
Jan. 5 to June 18 (151 + 13) = 164 "
Mar. 15 to Nov. 29 (245 + 14) = 259 "

MULTIPLICATION OF TWO RATES AT ONE OPERATION

Pay Roll Example—15% Bonus

Hrs.	Straight Time	Bonus	Extension
48	$30.00	$4.50	$34.50
52	33.50	5.02	38.52
44	28.10	4.21	32.31
46	29.30	4.39	33.69

Place bonus rate or 15% on levers 9-8. Place total extension or 1.15% on levers 3-2-1. Shift carriage to 4th position and multiply by usual method. Point off four places from right, the product dial reading as $4.50 on dials 12-11-10 and $34.50 on dials 6-5-4-3. As most firms use a set bonus rate, it is not necessary to change levers. Continue operation in same manner as described in MULTIPLICATION BY CONSTANT.

This method can be used to advantage in figuring two TAX rates at the same operation.

CHAIN DISCOUNTS

The simplest way to handle this class of work is by having a table of decimal equivalents made of the most common discounts used in your individual business, similar to the one given on page 23. If list of discounts is given us we will cheerfully make out table for you.

If table cannot be used the net of your amount can easily be worked out as follows:

$73.00 less 25-10-10%.

Set 73.00 on the machine, multiply by 100 and point off four places in the product. Now space your carriage to the tens column and reverse handle two strokes, space to units column and reverse five strokes, the 25 showing in red and denoting that 25 has been deducted from 100. Result, 54.75. Clear levers and set up 54.75. Clear the dials and multiply by 100 again, space carriage to tens column and reverse one stroke, equaling 49.275. Set up 49,275, point off five places (because we have an extra decimal place in 49.275), multiply by 100 less 10. Answer, 44.3475.

If you have a discount with fractions simply reduce the fraction to a decimal equivalent and deduct in same way.

Example: 73.00 less 17¾%

Set 73.00 on the levers, shift carriage to the fifth column and multiply by 1.0000—deduct .1775 (17¾) by reversing handle. Answer, 60.04.

If you have a number of amounts from which the same rate of discount is to be deducted, get your decimal equivalent of the rate, set same on machine and multiply by the various amounts without clearing the machine, using method described in MULT. BY CONSTANT.

24.75 = 16.51
35.94 = 23.97
247.56 less 20-10-5-2½% = 165.10
354.33 = 236.30
24.78 = 16.53

Referring to table on page 23 we find the decimal equivalent of 20-10-5-2½% to be .6669; therefore, set this number on machine, point off six places in product dial (4+2), four in multiplicand, and two in multiplier; then multiply by 24.75, getting answer of 16.51. To obtain the next result simply interchange left hand dial until all items have been figured.

TABLE OF CHAIN DISCOUNTS

Rate		2½	5	5-2½	5-5	5-5-2½	7½	7½-2½	7½-5	10	10-2½	10-5	10-5-2½	10-10	10-10-5	10-10-10
10	**.9000**	**.8775**	**.8550**	**.8336**	**.8122**	**.7919**	**.8325**	**.8117**	**.7909**	**.8100**	**.7897**	**.7695**	**.7503**	**.7290**	**.6925**	**.6561**
	.1000	.1225	.1450	.1664	.1878	.2081	.1675	.1883	.2091	.1900	.2103	.2305	.2497	.2710	.3075	.3439
12½	**.8750**	**.8531**	**.8312**	**.8105**	**.7897**	**.7699**	**.8094**	**.7891**	**.7689**	**.7875**	**.7678**	**.7481**	**.7294**	**.7087**	**.6733**	**.6379**
	.1250	.1469	.1688	.1895	.2103	.2301	.1906	.2109	.2311	.2125	.2322	.2519	.2706	.2913	.3267	.3621
15	**.8500**	**.8287**	**.8075**	**.7873**	**.7671**	**.7479**	**.7862**	**.7666**	**.7469**	**.7650**	**.7459**	**.7267**	**.7086**	**.6885**	**.6541**	**.6196**
	.1500	.1713	.1925	.2127	.2329	.2521	.2138	.2334	.2531	.2350	.2541	.2733	.2914	.3115	.3459	.3804
16 2/3	**.8333**	**.8125**	**.7917**	**.7719**	**.7521**	**.7333**	**.7708**	**.7516**	**.7323**	**.7500**	**.7312**	**.7125**	**.6947**	**.6750**	**.6412**	**.6075**
	.1667	.1875	.2083	.2281	.2479	.2667	.2292	.2484	.2677	.2500	.2688	.2875	.3053	.3250	.3588	.3925
20	**.8000**	**.7800**	**.7600**	**.7410**	**.7220**	**.7039**	**.7400**	**.7215**	**.7030**	**.7200**	**.7020**	**.6840**	**.6669**	**.6480**	**.6156**	**.5832**
	.2000	.2200	.2400	.2590	.2780	.2961	.2600	.2785	.2970	.2800	.2980	.3160	.3331	.3520	.3844	.4168
25	**.7500**	**.7312**	**.7125**	**.6947**	**.6769**	**.6600**	**.6937**	**.6764**	**.6591**	**.6750**	**.6581**	**.6412**	**.6252**	**.6075**	**.5771**	**.5467**
	.2500	.2688	.2875	.3053	.3231	.3400	.3063	.3236	.3409	.3250	.3419	.3588	.3748	.3925	.4229	.4533
30	**.7000**	**.6825**	**.6650**	**.6484**	**.6317**	**.6160**	**.6475**	**.6313**	**.6151**	**.6300**	**.6142**	**.5985**	**.5835**	**.5670**	**.5386**	**.5103**
	.3000	.3175	.3350	.3516	.3683	.3840	.3525	.3687	.3849	.3700	.3858	.4015	.4165	.4330	.4614	.4897
33 1/3	**.6667**	**.6500**	**.6333**	**.6175**	**.6017**	**.5866**	**.6167**	**.6012**	**.5858**	**.6000**	**.5850**	**.5700**	**.5557**	**.5400**	**.5130**	**.4860**
	.3333	.3500	.3667	.3825	.3983	.4134	.3833	.3988	.4142	.4000	.4150	.4300	.4443	.4600	.4870	.5140
35	**.6500**	**.6337**	**.6175**	**.6021**	**.5866**	**.5720**	**.6012**	**.5862**	**.5712**	**.5850**	**.5704**	**.5557**	**.5419**	**.5265**	**.5002**	**.4738**
	.3500	.3663	.3825	.3979	.4134	.4280	.3988	.4138	.4288	.4150	.4296	.4443	.4581	.4735	.4998	.5262
37½	**.6250**	**.6094**	**.5937**	**.5789**	**.5641**	**.5500**	**.5781**	**.5637**	**.5492**	**.5625**	**.5484**	**.5344**	**.5210**	**.5062**	**.4809**	**.4556**
	.3750	.3906	.4063	.4211	.4359	.4500	.4219	.4363	.4508	.4375	.4516	.4656	.4790	.4938	.5191	.5444
40	**.6000**	**.5850**	**.5700**	**.5557**	**.5415**	**.5280**	**.5550**	**.5411**	**.5272**	**.5400**	**.5265**	**.5130**	**.5002**	**.4860**	**.4617**	**.4374**
	.4000	.4150	.4300	.4443	.4585	.4720	.4450	.4589	.4728	.4600	.4735	.4870	.4998	.5140	.5383	.5626
45	**.5500**	**.5362**	**.5225**	**.5094**	**.4964**	**.4840**	**.5087**	**.4960**	**.4833**	**.4950**	**.4826**	**.4702**	**.4585**	**.4455**	**.4232**	**.4009**
	.4500	.4638	.4775	.4906	.5036	.5160	.4913	.5040	.5167	.5050	.5174	.5298	.5415	.5545	.5768	.5991
50	**.5000**	**.4875**	**.4750**	**.4631**	**.4512**	**.4400**	**.4625**	**.4509**	**.4394**	**.4500**	**.4387**	**.4275**	**.4168**	**.4050**	**.3847**	**.3645**
	.5000	.5125	.5250	.5369	.5488	.5600	.5375	.5491	.5606	.5500	.5613	.5725	.5832	.5950	.6153	.6355
60	**.4000**	**.3900**	**.3800**	**.3705**	**.3610**	**.3520**	**.3700**	**.3607**	**.3515**	**.3600**	**.3510**	**.3420**	**.3334**	**.3240**	**.3078**	**.2916**
	.6000	.6100	.6200	.6295	.6390	.6480	.6300	.6393	.6485	.6400	.6490	.6580	.6666	.6760	.6922	.7084
62½	**.3750**	**.3656**	**.3562**	**.3473**	**.3384**	**.3300**	**.3469**	**.3382**	**.3295**	**.3375**	**.3291**	**.3206**	**.3126**	**.3037**	**.2886**	**.2734**
	.6250	.6344	.6438	.6527	.6616	.6700	.6531	.6618	.6705	.6625	.6709	.6794	.6874	.6963	.7114	.7266
66 2/3	**.3333**	**.3250**	**.3167**	**.3087**	**.3008**	**.2933**	**.3083**	**.3006**	**.2929**	**.3000**	**.2925**	**.2850**	**.2779**	**.2700**	**.2565**	**.2430**
	.6667	.6750	.6833	.6913	.6992	.7067	.6917	.6994	.7071	.7000	.7075	.7150	.7221	.7300	.7435	.7570
70	**.3000**	**.2925**	**.2850**	**.2779**	**.2707**	**.2640**	**.2775**	**.2706**	**.2636**	**.2700**	**.2632**	**.2565**	**.2501**	**.2430**	**.2308**	**.2187**
	.7000	.7075	.7150	.7221	.7293	.7360	.7225	.7294	.7364	.7300	.7368	.7435	.7499	.7570	.7692	.7813
80	**.2000**	**.1950**	**.1900**	**.1852**	**.1805**	**.1760**	**.1850**	**.1804**	**.1757**	**.1800**	**.1755**	**.1710**	**.1667**	**.1620**	**.1539**	**.1458**
	.8000	.8050	.8100	.8148	.8195	.8240	.8150	.8196	.8243	.8200	.8245	.8290	.8333	.8380	.8461	.8542
87½	**.1250**	**.1219**	**.1187**	**.1158**	**.1128**	**1100**	**.1156**	**.1127**	**.1098**	**.1125**	**.1097**	**.1069**	**.1042**	**.1012**	**.0962**	**.0911**
	.8750	.8781	.8813	.8842	.8872	.8900	.8844	.8873	.8902	.8875	.8903	.8931	.8958	.8988	.9038	.9089

Directions for Use of Table

EXAMPLE: Find net amount of $1560.75 after deducting a discount of 37½-5-5-2½%. First get 37½ at the left hand side of table, then run the finger along until you reach the decimal figure under 5-5-2½ at top of table. In this case it is .5500. Now multiply 1560.75 × .5500, pointing off six places in the product. Answer equals 858.41. If net discount is required use light figures under heavy figures.

FOREIGN EXCHANGE

English

12 pence (d.) = 1 shilling (s.)
20 shillings (s.) = 1 £ Sterling
1 s. = 1/20 or .05 of a £
1 d. = 1/240 or .00416 of a £

A penny equals approximately 2 cents in United States currency, so that the simplest way to handle any amount of pence that may occur in an example is to multiply same mentally by 2, adding the result after the £ and shillings have been figured on the machine.

2d. = 4 cts. 5 d. = 10 cts. 8 d. = 16 cts., etc.

Shillings are reduced to decimals of a £ by multiplying by 5.

Example: 1s. = .05 of a £. 3 s. = .15 of a £. 8 s. = .40 of a £. 17 s. = .85 of a £, etc.

CONVERSION OF £, s. and d. TO U. S. CURRENCY

Convert £7 5s to U. S. at a rate of exchange of $4.85. These rates vary from day to day. The example is £7 5s × 4.85, or, reducing the 5 shillings to a decimal of a £, we have 7.25 × 4.85. Set 4.85 on the machine and multiply by 7.25, pointing off 4 places in the Product. Answer = $35.16.

Example No. 2: Convert £145 15s 3d @ 4.87¼. 145.75 × 4.8725 + 6c. Set rate of exchange, 4.8725 (4.87¼) on machine, point off 6 places in the Product dials, and multiply by 145.76 = 710.17. Now multiply mentally the 3 pence by 2 = 6c. $710.17 + 6c = $710.23, answer.

Example No. 3:

£245-3s-4d @ 4.85¾ = $ 1190.82 + 8c = 1190.90.
£2354-4s-7d @ 4.85¾ = 11435.53 + 14c = 11435.67.
£765-7s-2d @ 4.85¾ = 3717.69 + 4c = 3717.73.
£3256-8s-9d @ 4.85¾ = 15817.96 + 18c = 15818.14.

In example No. 3 you have the same rate for all the conversions, so set the constant rate 4.8575 on machine, point off 6 places in the Product dials and multiply by 245.15 = 1190.82 + 8c = 1190.90. Leave the figures in the machine and interchange in the multiplier, as described in MULTIPLICATION BY CONSTANT.

TABLE OF PENCE IN DECIMALS OF 1 POUND STERLING FOR USE ON MARCHANT CALCULATOR

	1/16	3/16	5/16	7/16	9/16	11/16	13/16	15/16
0	.000 260	.000 781	.001 302	.001 823	.002 344	.002 865	.003 385	.003 906
1	.004 427	.004 948	.005 469	.005 990	.006 510	.007 031	.007 552	.008 073
2	.008 594	.009 115	.009 635	.010 156	.010 677	.011 198	.011 719	.012 240
3	.012 760	.013 281	.013 802	.014 323	.014 844	.015 365	.015 885	.016 406
4	.016 927	.017 448	.017 969	.018 490	.019 010	.019 531	.020 052	.020 573
5	.021 094	.021 615	.022 135	.022 656	.023 177	.023 698	.024 219	.024 740
6	.025 260	.025 781	.026 302	.026 823	.027 344	.027 865	.028 385	.028 906
7	.029 427	.029 948	.030 469	.030 990	.031 510	.032 031	.032 552	.033 073
8	.033 594	.034 115	.034 635	.035 156	.035 677	.036 198	.036 719	.037 240
9	.037 760	.038 281	.038 802	.039 323	.039 844	.040 365	.040 885	.041 406
10	.041 927	.042 448	.042 969	.043 490	.044 010	.044 531	.045 052	.045 573
11	.046 094	.046 615	.047 135	.047 656	.048 177	.048 698	.049 219	.049 740

	1/8	3/8	5/8	7/8	1/4	3/4	1/2	Pence
0	.000 521	.001 562	.002 604	.003 646	.001 042	.003 125	.002 083	
1	.004 687	.005 729	.006 771	.007 812	.005 208	.007 292	.006 250	.004 167
2	.008 854	.009 896	.010 937	.011 979	.009 375	.011 458	.010 417	.008 333
3	.013 021	.014 062	.015 104	.016 146	.013 542	.015 625	.014 583	.012 500
4	.017 187	.018 229	.019 271	.020 312	.017 708	.019 792	.018 750	.016 667
5	.021 354	.022 396	.023 437	.024 479	.021 875	.023 958	.022 917	.020 833
6	.025 521	.026 562	.027 604	.028 646	.026 042	.028 125	.027 083	.025 000
7	.029 687	.030 729	.031 771	.032 812	.030 208	.032 292	.031 250	.029 167
8	.033 854	.034 896	.035 937	.036 979	.034 375	.036 458	.035 417	.033 333
9	.038 021	.039 062	.040 104	.041 146	.038 542	.040 625	.039 583	.037 500
10	.042 187	.043 229	.044 271	.045 312	.042 708	.044 792	.043 750	.041 667
11	.046 354	.047 396	.048 437	.049 479	.046 875	.048 958	.047 917	.045 833

Example

Change £18227 17s 8¾d to Chinese Taels @ 2s 11¼d.

Reduce shillings and pence to decimal equivalents of a pound as per table above.

18227	18227.		
17s (1s equals .05)	.85	2s (1s equals .05)	.10
8¾d (see table)	.036458	11¼d (see table)	.046875
	18227.886458		.146875

Now set .146875 on machine and divide it into 18227.886458, using multiplication method. ANSWER: 124104.76.

DECIMAL EQUIVALENTS OF A POUND STERLING

FOR SHILLING AND PENCE

	s d		s d		s d		s d		s d
.00417	0- 1	.20417	4- 1	.40417	8- 1	.60417	12- 1	.80417	16- 1
.00833	0- 2	.20833	4- 2	.40833	8- 2	.60833	12- 2	.80833	16- 2
.01250	0- 3	.21250	4- 3	.41250	8- 3	.61250	12- 3	.81250	16- 3
.01667	0- 4	.21667	4- 4	.41667	8- 4	.61667	12- 4	.81667	16- 4
.02083	0- 5	.22083	4- 5	.42083	8- 5	.62083	12- 5	.82083	16- 5
.02500	0- 6	.22500	4- 6	.42500	8- 6	.62500	12- 6	.82500	16- 6
.02917	0- 7	.22917	4- 7	.42917	8- 7	.62917	12- 7	.82917	16- 7
.03333	0- 8	.23333	4- 8	.43333	8- 8	.63333	12- 8	.83333	16- 8
.03750	0- 9	.23750	4- 9	.43750	8- 9	.63750	12- 9	.83750	16- 9
.04167	0-10	.24167	4-10	.44167	8-10	.64167	12-10	.84167	16-10
.04583	0-11	.24583	4-11	.44583	8-11	.64583	12-11	.84583	16-11
.05000	1- 0	.25000	5- 0	.45000	9- 0	.65000	13- 0	.85000	17- 0
.05417	1- 1	.25417	5- 1	.45417	9- 1	.65417	13- 1	.85417	17- 1
.05833	1- 2	.25833	5- 2	.45833	9- 2	.65833	13- 2	.85833	17- 2
.06250	1- 3	.26250	5- 3	.46250	9- 3	.66250	13- 3	.86250	17- 3
.06667	1- 4	.26667	5- 4	.46667	9- 4	.66667	13- 4	.86667	17- 4
.07083	1- 5	.27083	5- 5	.47083	9- 5	.67083	13- 5	.87083	17- 5
.07500	1- 6	.27500	5- 6	.47500	9- 6	.67500	13- 6	.87500	17- 6
.07917	1- 7	.27917	5- 7	.47917	9- 7	.67917	13- 7	.87917	17- 7
.08333	1- 8	.28333	5- 8	.48333	9- 8	.68333	13- 8	.88333	17- 8
.08750	1- 9	.28750	5- 9	.48750	9- 9	.68750	13- 9	.88750	17- 9
.09167	1-10	.29167	5-10	.49167	9-10	.69167	13-10	.89167	17-10
.09583	1-11	.29583	5-11	.49583	9-11	.69583	13-11	.89583	17-11
.10000	2- 0	.30000	6- 0	.50000	10- 0	.70000	14- 0	.90000	18- 0
.10417	2- 1	.30417	6- 1	.50417	10- 1	.70417	14- 1	.90417	18- 1
.10833	2- 2	.30833	6- 2	.50833	10- 2	.70833	14- 2	.90833	18- 2
.11250	2- 3	.31250	6- 3	.51250	10- 3	.71250	14- 3	.91250	18- 3
.11667	2- 4	.31667	6- 4	.51667	10- 4	.71667	14- 4	.91667	18- 4
.12083	2- 5	.32083	6- 5	.52083	10- 5	.72083	14- 5	.92083	18- 5
.12500	2- 6	.32500	6- 6	.52500	10- 6	.72500	14- 6	.92500	18- 6
.12917	2- 7	.32917	6- 7	.52917	10- 7	.72917	14- 7	.92917	18- 7
.13333	2- 8	.33333	6- 8	.53333	10- 8	.73333	14- 8	.93333	18- 8
.13750	2- 9	.33750	6- 9	.53750	10- 9	.73750	14- 9	.93750	18- 9
.14167	2-10	.34167	6-10	.54167	10-10	.74167	14-10	.94167	18-10
.14583	2-11	.34583	6-11	.54583	10-11	.74583	14-11	.94583	18-11
.15000	3- 0	.35000	7- 0	.55000	11- 0	.75000	15- 0	.95000	19- 0
.15417	3- 1	.35417	7- 1	.55417	11- 1	.75417	15- 1	.95417	19- 1
.15833	3- 2	.35833	7- 2	.55833	11- 2	.75833	15- 2	.95833	19- 2
.16250	3- 3	.36250	7- 3	.56250	11- 3	.76250	15- 3	.96250	19- 3
.16667	3- 4	.36667	7- 4	.56667	11- 4	.76667	15- 4	.96667	19- 4
.17083	3- 5	.37083	7- 5	.57083	11- 5	.77083	15- 5	.97083	19- 5
.17500	3- 6	.37500	7- 6	.57500	11- 6	.77500	15- 6	.97500	19- 6
.17917	3- 7	.37917	7- 7	.57917	11- 7	.77917	15- 7	.97917	19- 7
.18333	3- 8	.38333	7- 8	.58333	11- 8	.78333	15- 8	.98333	19- 8
.18750	3- 9	.38750	7- 9	.58750	11- 9	.78750	15- 9	.98750	19- 9
.19167	3-10	.39167	7-10	.59167	11-10	.79167	15-10	.99167	19-10
.19583	3-11	.39583	7-11	.59583	11-11	.79583	15-11	.99583	19-11
.20000	4- 0	.40000	8- 0	.60000	12- 0	.80000	16- 0	1.00000	20- 0

TAX APPORTIONMENT

Apportion $45,298.74 to the following funds at rates given totaling 1.874.

General Fund	.510		=$12,327.83
Hospital "	.213		= 5,148.68
Salary "	.320		= 7,735.11
School "	.263		= 6,357.29
Road "	.450	× 24172.22	= 10,877.50
Interest "	.040		= 966.89
Library "	.010		= 241.72
University "	.025		= 604.31
Asylum "	.043		= 1,039.41
	1.874		$45,298.74

Divide 45298.74 by the rate 1.874 = *24172.22.*

Set this result on machine, point off five places in the Product and multiply as in MULTIPLICATION BY CONSTANT.

EXTENSION OF COUNTY AND CITY TAXES WHERE A NUMBER OF DIFFERENT RATES EXIST AS IN SCHOOL TAX WORK, ETC.

Total Rate $2.27, divided as follows:

Assessment.		1.34	.24	.34	.20	.15	Total
A	$ 3,150	42.21	7.56	10.71	6.30	4.73	71.51
B	2,550	34.17	6.12	8.67	5.10	3.83	57.89
C	12,350	165.49	29.64	41.99	24.70	18.52	280.34
D	850	11.39	2.04	2.89	1.70	1.27	19.29
E	1,200	16.08	2.88	4.08	2.40	1.80	27.24
Total	$20,100	269.34	48.24	68.34	40.20	30.15	456.27

First method—If the assessments are very large, set rate 1.34 on levers and multiply by 3,150, 2,550, etc., as per MULTIPLICATION BY CONSTANT.

Second method—If the assessments are about the size of those shown in the example, or smaller, set two rates at a time in the machine, thus saving one-half the time it would ordinarily take to figure same.

Example: Set on the machine the first rate 1.34 on levers 9-8-7, then on levers 2-1, set the second rate .24. Space carriage to units column, turn handle once, throwing figures into the Product dials and point off decimals, giving 000.013400.0024—now multiply by 3150, getting 42.21 and 7.56 as the first two answers. Leave figures in the machine and continue operation as in MULTIPLICATION BY CONSTANT.

Third method—Set the ASSESSMENT on the levers and multiply by the various rates, 1.34, .24, etc. These rates can be very easily memorized and the amounts called off as rapidly as they can be written down, if two men are used on the work.

FIGURING DELINQUENT TAX PENALTIES

Taxes (dates given simply to illustrate) third Monday of October. First installment delinquent first Monday of December—penalty 15%

	1st Install.		Extension.	Tax + Penalty.
A	22.45	× .15 .... 1.15	= 3.37	25.82
B	135.62		= 20.34	155.96
C	17.55		= 2.63	20.18
D	43.64		= 6.55	50.19

.15 = penalty on 1.00. 1.15 = 1.00 tax plus penalty.

Set the rate of penalty .15 on levers Nos. 9-8, and 1.15 on levers 3-2-1, give handle one forward turn, throwing amounts into Product dials and point off as follows: 00.0015000.0115.

Now multiply by 22.45, getting extension 3.37 and the addition of the tax + penalty 25.82 at one operation. Leave the various amounts in machine and continue as in MULTIPLICATION BY CONSTANT, changing 22.45 to 135.62, etc.

On the last Monday in April, if first or last installment is not paid, an additional 5% penalty is added.

2nd Install.				
A	22.45	× .05 .... 1.20	= 1.12	26.94
B	135.61		= 6.78	162.73
C	17.55		= .88	21.06
D	43.63		= 2.18	52.36

.05 = additional penalty. 1.20 = tax + .05 + .15.

Sewer or Street Assessment Work

In this class of work set the assessed value per square foot on the levers as a constant and multiply by the number of feet in each case, using method as described in MULTIPLICATION BY CONSTANT.

Example:

	Sq. Feet		Rate of Assm't	Amount
A	245			= $ 44.71
B	124			= 22.63
C	78	×	.182479	= 14.23
D	2254			= 411.31
E	1683			= 307.11
F	775			= 141.42

Point off six places in the Product dials to take care of the rate, multiply by 245, getting 44.71; change 245 to 124, getting 22.63, etc.

Above example completed in 38 seconds.

Reducing Square Feet to Acreage

Instead of dividing the number of square feet in each instance by 43560, the number of square feet per acre, set the reciprocal of 43560, which is .000,022,956,8, on the levers, point off 10 places in the Product dials and multiply by the various amounts of square feet you wish reduced, using the MULT. BY CONSTANT method.

Example:

Sq. ft.		Reciprocal	Acreage
22345	×	.000,022,956,8	= .512,970
354675			= 8.142,203
27698			= .635,857
8523			= .195,661
413,2[illegible] = 9,4[illegible]			[illegible]

ENGINEERING CALCULATIONS

Traverses

Traverse figuring is simplified on the MARCHANT because the natural sine and co-sine are used instead of logarithms in getting the Latitude and Departure.

Example: Bearing N. 34° 36′ E. Distance 295.76—Nat. co-sine of angle .82314—sine .56784.

.82314 × 295.76 = 243.452 Northing
.56784 " " = 167.944 Easting

Place the distance 295.76 on levers as a constant, point off 7 places in the Product dials (5 places in sines and 2 in distance) and multiply by 82314. Leave the figures in the machine and interchange in the multiplier as in MULTIPLICATION BY CONSTANT, to 56784, getting second result.

EXTRACTION OF SQUARE ROOT

***Symbols used in Explanations:** *Dial D—Right Hand or Product Dial. Dial E—Left Hand or Proof Dial.*

Square root can be easily extracted on the machine by using the following numbers as a basis:

1 — 3 — 5 — 7 — 9 — 11 — 13 — 15 — 17
The square root of 4 = 2
4 — 1 = 3 — 3 = 0

To get the square root of 4 by use of the machine, first set 4 on the machine and register the 4 in Dial "D," the same as in Division, and clear Dial "E" of the 1. Now subtract 1 from the 4, leaving 3 in Dial "D" and 1 in Dial "E." Change lever resting at 1 to 3 and subtract the 3, leaving 0 in Dial "D" and 2 in Dial "E." The original amount that you desire to extract the square root from having disappeared, you know that your example is finished, also that the example was an even one, there being no remainder left in the machine. Your square root or 2 appears in Dial "E."

Find Square Root of 65

Register 65 in Dial "D" and clear levers, also Dial "E" as in above example. Set 1 on machine and subtract; change 1 to 3 and subtract, 3 to 5, etc. In 8 subtractions of 1 — 3 — 5 — 7 — 9 — 11 — 13 —15, you will have 1 left in Dial "D" as the remainder and 8 in Dial "E" as the square root. With a number over two figures the amount should be registered in the left end of Dial "D" so as to leave room to use all the levers if necessary to carry out a decimal in your square root.

Find Square Root of 144

Set 144 on left end of the machine, and register it in extreme left end of Dial "D." Clear levers and Dial "E." Now point off two places from the right end of your amount, setting your decimal to the right of the figure 1 and showing that your square root will have two figures. Set a lever to 1 right over the 1 of the 144 and subtract, leaving 044 in the left end of Dial "D" and 1 in Dial "E." As you have nothing to subtract from you cannot raise the lever at 1 to 3 as in the previous example; you must shift the carriage one place to the left, bringing the 4 of the 44 right under the lever at 1. Now change lever to 2, which will represent 2 times the figure in Dial "E." Bring down the next lever to 1, making 21 to be subtracted from the 44 under it. Subtract and note 23 in Dial "D" and 11 in Dial "E." 23 is larger than the 21 on the machine, so change the lever resting at 1 to 3, the 2 of the 21 remaining as a constant. Subtract and you have nothing left in Dial "D," while 12 is in Dial "E," or square root of 144.

Find Square Root of 185234

Register 185234 at extreme left of Dial "D." Point off from the right end, putting decimal point after the 185, showing three places in your answer. Clear as explained. Set a lever to 1 right over the 8 of the 185 Not over the 1, as you must first subtract your table 1 — 3 — 5, etc., from the 18.5 In 4 turns subtracting 1 — 3 — 5 — 7 you have left 025234 at left end of Dial "D," so change lever at 7 to 8. Always add 1 to the last lever when starting a new series. Note that the 8 is 2 times the figure in Dial "E." This is a good check on your work in case you make an error. Shift carriage one place to the left and bring down next lever to 1, making 81, and subtract; change 1 to 3, the 8 remaining as a constant; subtract; change 3 to 5 and subtract, leaving 000334 in left end of Dial "D" and 43 in Dial "E" and levers at 85; change lever at 5 to 6, making 86. Shift carriage one place to the left and bring down next lever to 1. Subtract and note the error, as you cannot subtract 861 from 334. Reverse your handle, 0334 again appearing in Dial "D." Don't forget to throw back last lever resting at 1 to zero after you have corrected your error. Pull down next lever to 1, making 8601, and shift carriage once more to the left, 430 being the result so far of your square root. Subtract the 8601 from the 33400, change 4th lever from 1 to 3 and subtract; change to 5 and subtract. As you cannot subtract any more from that point, shift carriage to the left, change 4th lever to 6, making 8606, and bring 5th lever to 1, subtracting 86061; change 1 to 3 to 5 to 7 to 9. In 5 turns you have left in Dial "D" 328775 and 86069 set up with the levers. You can still subtract, so change the 69 to 71, reading 86071, or 2 more than previously, your rule being to add 2 to the end figures each turn; subtract, change 5th lever to 3, subtract and change to 5 and this last subtraction will leave 70556 in Dial "D" or less than 86075 on machine. Your square root in Dial "E" will read 430.38.

To prove your result, set 430.38 on the machine and multiply by 430.38 so that the result will be added to the remainder in Dial "D" 70556; your total product will be 185234, proving conclusively the correctness of your work.

FIRE INSURANCE

Parts of Month

Rate $1.00				**Rate 80c**			
Decimal Part of 365				Decimal Part of 365			
Days	Dec. Eq.	Days	Dec. Eq.	Days	Dec. Eq.	Days	Dec. Eq.
1	.002 740	16	.043 836	1	.002 192	16	.035 068
2	.005 479	17	.046 575	2	.004 383	17	.037 260
3	.008 219	18	.049 315	3	.006 575	18	.039 452
4	.010 959	19	.052 055	4	.008 767	19	.041 644
5	.013 699	20	.054 795	5	.010 959	20	.043 836
6	.016 438	21	.057 534	6	.013 151	21	.046 027
7	.019 178	22	.060 274	7	.015 342	22	.048 219
8	.021 918	23	.063 014	8	.017 534	23	.050 411
9	.024 657	24	.065 753	9	.019 726	24	.052 603
10	.027 397	25	.068 493	10	.021 918	25	.054 794
11	.030 137	26	.071 233	11	.024 110	26	.056 986
12	.032 877	27	.073 973	12	.026 301	27	.059 178
13	.035 616	28	.076 712	13	.028 493	28	.061 370
14	.038 356	29	.079 452	14	.030 685	29	.063 562
15	.041 096	30	.082 192	15	.032 877	30	.065 753
		31	.084 931			31	.067 945

Problem—1 to 31 days/365 × $1.00 rate or .80c rate × Am't of Pol.

Solution

Set up as a constant on the "upper dial" the decimal equivalent of the **number of days** at either $1.00 or .80c rate; then multiply by all of the **same** number of days before changing.

Then change to the next number of days, and so on.

TABLE OF DECIMAL EQUIVALENTS OR THE FRACTIONAL PARTS OF A GROSS FOR BILLING WHEN PRICES ARE MADE BY THE GROSS AND AMOUNTS ARE GIVEN IN DOZENS OR NUMBER OF ARTICLES

Doz.		1	2	3	4	5	6	7	8	9	10	11
		.00694	.01389	.02083	.02778	.03472	.04167	.04861	.05555	.06250	.06944	.07639
1............	.08333	.09028	.09722	.10417	.11111	.11805	.12500	.13194	.13889	.14583	.15278	.15972
2............	.16667	.17361	.18055	.18750	.19444	.20139	.20833	.21528	.22222	.22917	.23611	.24305
3............	.25000	.25694	.26389	.27083	.27778	.28472	.29167	.29861	.30555	.31250	.31944	.32639
4............	.33333	.34028	.34722	.35417	.36111	.36805	.37500	.38194	.38889	.39583	.40278	.40972
5............	.41667	.42361	.43055	.43750	.44444	.45139	.45833	.46528	.47222	.47917	.48611	.49305
6............	50000	.50694	.51389	.52083	.52778	.53472	.54167	.54861	.55555	.56250	.56944	.57639
7............	.58333	.59028	.59722	.60417	.61111	.61805	.62500	.63194	.63889	.64583	.65278	.65972
8............	.66667	.67361	.68055	.68750	.69444	.70139	.70833	.71528	.72222	.72917	.73611	.74305
9............	.75000	.75694	.76389	.77083	.77778	.78472	.79167	.79861	.80555	.81250	.81944	.82639
10............	.83333	.84028	.84722	.85417	.86111	.86805	.87500	.88194	.88889	.89583	.90278	.90972
11............	.91667	.92361	.93055	.93750	.94444	.95139	.95833	.96528	.97222	.97917	.98611	.99305

DECIMALS OF A FOOT FOR EACH ONE-EIGHTH OF AN INCH

		⅛″	¼″	⅜″	½″	⅝″	¾″	⅞″
		.01042	.02083	.03125	.04167	.05208	.06250	.07292
1″	.08333	.09375	.10417	.11458	.12500	.13542	.14583	.15625
2″	.16667	.17708	.18750	.19792	.20833	.21875	.22917	.23958
3″	.25000	.26042	.27083	.28125	.29167	.30208	.31250	.32292
4″	.33333	.34375	.35417	.36458	.37500	.38542	.39583	.40625
5″	.41667	.42708	.43750	.44792	.45833	.46875	.47917	.48958
6″	.50000	.51042	.52083	.53125	.54167	.55208	.56250	.57292
7″	.58333	.59375	.60417	.61458	.62500	.63542	.64583	.65625
8″	.66667	.67708	.68750	.69792	.70833	.71875	.72917	.73958
9″	.75000	.76042	.77083	.78125	.79167	.80208	.81250	.82292
10″	.83333	.84375	.85417	.86458	.87500	.88542	.89583	.90625
11″	.91667	.92708	.93750	.94792	.95833	.96875	.97917	.98958

TABLE OF DECIMAL EQUIVALENTS OF MINUTES IN AN HOUR FOR FIGURING PAYROLLS AND COST ACCOUNTING

Min.	Hour	Min.	Hour	Min.	Hour	Min.	Hour
1	.017	16	.267	31	.517	46	.767
2	.033	17	.283	32	.533	47	.783
3	.050	18	.300	33	.550	48	.800
4	.067	19	.317	34	.567	49	.817
5	.083	20	.333	35	.583	50	.833
6	.100	21	.350	36	.600	51	.850
7	.117	22	.367	37	.617	52	.867
8	.133	23	.383	38	.633	53	.883
9	.150	24	.400	39	.650	54	.900
10	.167	25	.417	40	.667	55	.917
11	.183	26	.433	41	.683	56	.933
12	.200	27	.450	42	.700	57	.950
13	.217	28	.467	43	.717	58	.967
14	.233	29	.483	44	.733	59	.983
15	.250	30	.500	45	.750	60	1.000

DECIMAL EQUIVALENTS OF COMMON FRACTIONS

½s	3rds	4ths	6ths	8ths	12ths	16ths	32nds	Dec. Eq.
							1/32	.031 25
						1/16	2/32	.062 5
					1/12			.083 33
							3/32	.093 75
				1/8		2/16	4/32	.125
							5/32	.156 25
			1/6		2/12			.166 67
						3/16	6/32	.187 5
							7/32	.218 75
		1/4		2/8	3/12	4/16	8/32	.25
							9/32	.281 25
						5/16	10/32	.312 5
	1/3		2/6		4/12			.333 33
							11/32	.343 75
				3/8		6/16	12/32	.375
							13/32	.406 25
					5/12			.416 7
						7/16	14/32	.437 5
							15/32	.468 75
1/2		2/4	3/6	4/8	6/12	8/16	16/32	.5
							17/32	.531 25
						9/16	18/32	.562 5
					7/12			.583 3
							19/32	.593 75
				5/8		10/16	20/32	.625
							21/32	.656 25
	2/3		4/6		8/12			.666 67
						11/16	22/32	.687 5
							23/32	.718 75
		3/4		6/8	9/12	12/16	24/32	.75
							25/32	.781 25
						13/16	26/32	.812 5
			5/6		10/12			.833 33
							27/32	.843 75
				7/8		14/16	28/32	.875
							29/32	.906 25
					11/12			.916 67
						15/16	30/32	.937 5
							31/32	.968 75

[illegible]
9.43560 = 4.6390879
0.0000229568 = 5.3609121
Recip.

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Reciprocal of 66 = .01515
" " 43560 = 0.0000229568

SERVICE STATIONS

EASTERN

Baltimore, Md.
208 Vickers Bldg.

Pittsburgh, Pa.
1312 Fulton Bldg.

Philadelphia, Pa.
900 Bulletin Bldg.

Cleveland, Ohio
308 Leader News Bldg.

New York City (Met. Dist. Only)
298 Broadway

Washington, D. C.
1330 G St., N. W.

SOUTHERN

Nashville, Tenn.
401 Fourth and
1st National Bank Bldg.

Dallas, Tex.
605 Sumpter Bldg.

MIDDLE WESTERN

Chicago
237 Railway Exchange Bldg.

WESTERN

Factory, Emeryville, Oakland, Calif.

NOTE—When shipping machines, use nearest station

FOREIGN AGENCIES

Armida & Co., Avenida Madero 28, Mexico, D. F.
Nix Bros., Calle Obispo 99, Habana, Cuba.
Sanchez Morales & Co., San Juan, Porto Rico.
Casa Pratt, Inc., Caixa Postal 1025, Rio de Janeiro, Brazil, S. A.
Pratt & Cia., Buenos Aires, Rep. Argentina, S. A.
Sociedad M. R. S. Curphey, Inc., Santiago, Chile, S. A.
Sociedad M. R. S. Curphey, Inc., Valparaiso, Chile, S. A.
C. H. Lemare, Antofagasta, Chile, S. A.
C. H. Lemare, Iquique, Chile, S. A.
C. H. Lemare, Lima, Peru, S. A.
Bolloten, Gould & Co., La Paz, Bolivia, S. A.
Mercantile Oversea Corporation, Guayaquil, Ecuador, S. A.
J. V. Mogollon & Co., Cartagena, Colombia, S. A.
J. V. Mogollon & Co., Bogota, Colombia, S. A.
J. G. Gill & Co., Panama, Panama Rep.
Guillermo Truniger & Co., Balmes 7, Barcelona, Espana.
Carl Lamm, Vasagatan 50, Stockholm, Sweden.
Office Appliances Co., Molenstraat 63, Hague, Holland.
Office Appliances Co., 22 Nanking Road, Shanghai, China.
Aug. Salvador, Via Vella, Mercede N. 33-34, Roma, Italy.
Metropolitan Mfg. Co., Brussels, Belgium.
Knudsen-Bommen, A. S., Box 11, Christiania, Norway.
Teijiro Kurosawa, 1-2, Owaricho-Nichome, Ginza, Tokio, Japan.
E. E. Huber, San Salvador, Salvador, C. A.
H. Hutchinson, P. O. Box 3, Georgetown, British Demerara, Guiana, S. A.
Office Appliances Co., Weltvereden, Dutch East Indies.
A. S. Denaxas Co., Stadium St. No. 11, Athens, Greece.
Smith, Bell & Co., Ltd., Manila, P. I.
Honolulu Star Bulletin, Honolulu, Ha.
Theo. Muggli, Zurich, Switzerland.
C. Beveridge, 112 Queen Victoria St., London E. C., England.
Borneo Co., Ltd., Bangkok, Singapore, F. M. S.
Gaston, Williams & Wigmore, 1-3 Rue Tartbout, Paris, France.
Remington Typewriter Agency, 9296 St. George's St., Cape Town, S. Africa.
Sands, MacDougal, Collins St., Melbourne, Australia.
B. A. Cheney, Santo Domingo, Santo Domingo, W. I.

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